

# APPENDIX III

## Chapter 1

# Kentucky's Per Capita Income: Catching Up to the Rest of the Country

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*A goal among many leaders in Kentucky is to see the state's per capita income equal or exceed the national per capita income average. Although Kentucky has narrowed the income gap recently, its per capita income still stands at only 81 percent of the national average. Matching this national level would require significant changes in Kentucky. The state would need large increases in the number of high school and college graduates in the state, and/or in the percentage of private sector employment per capita. Based on previous rates of increase, it will still be many years before Kentucky's per capita income is equal to the national average.*

## INTRODUCTION

A frequently used indicator of a state's economic health is per capita income. Historically, Kentucky's per capita income has been below that of the U.S. average, although that gap has narrowed in recent years. In 1995, per capita income in the U.S. stood at \$23,208 in 1995 while in Kentucky the level was \$18,849.<sup>1</sup> Many believe that an important goal for Kentucky is to narrow the gap between its income and that of the rest of the country. Kentucky Governor Paul Patton, in a recent speech to the Hopkinsville Chamber of Commerce, said that his goal was to see per capita income in Kentucky above the national average.<sup>2</sup> Although this may be a lofty goal, there is cause for optimism given the recent history of income levels in Kentucky. Indeed, while per capita income in Kentucky stood at only 78.3 percent of the national average in 1985, by 1995 it had increased steadily to 81.2 percent of the national average.

In this article, I examine long-term trends in Kentucky's per capita income relative to the national average. In the process, I address several questions: 1) Has the recent increase in Kentucky's per capita income relative to the U.S. average been part of a long-term increase or has it been confined to more recent years? 2) Has Kentucky's experience mirrored that of other states, or has it been unique? 3) What determines differences in per capita income at the state level? 4) Can these determinants explain why Kentucky's per capita income is below the national average? 5) What can explain the increase in Kentucky's per capita income relative to the national average in recent years? 6) How different would Kentucky have to be today to be at the national average

of per capita income? 7) How long will it take for Kentucky to reach the national average per capita income?

## PER CAPITA INCOME AS A MEASURE OF WELL-BEING OR STANDARD OF LIVING

Per capita income is often used by policymakers and the public as an overall index of well-being or standard of living in an economy. Thus, before proceeding with the analysis, it is important to examine what per capita income measures and to look at its strengths and weaknesses as an indicator of economic well-being.

Personal income data are collected by the U.S. Department of Commerce's Bureau of Economic Analysis as part of the National Income and Product Accounts. These data comprise wage and salary disbursements, other labor income, proprietor's income, rental income of persons, personal dividend income, personal interest income, and transfer payments to persons (e.g., Social Security, Aid to Families with Dependent Children, etc.). The majority of personal income comprises wage and salary disbursements, followed by transfer payments to persons and personal interest income. Table 1 shows the 1995 breakdown of personal income into its components for the U.S. and Kentucky.

Thus, personal income is just the total amount of income earned or disbursed to individuals in the economy in one form or another in a given year. Individuals then use this personal income to purchase goods and services, pay taxes, or place in savings or investments. It is thus a broad-based measure of economic well-being for the economy. Per capita personal income is simply the total personal income divided by the total population, which



# Kentucky's Per Capita Income: Catching Up to the Rest of the Country

**TABLE 1**

**Personal Income and Its Components, U.S. and Kentucky, 1995**

	Kentucky <sup>1</sup>		U.S. <sup>2</sup>	
	Amount	Percent	Amount	Percent
Wage and salary disbursements	40,644,369	86%	3,423,330	85%
Other labor income	5,476,497	12	423,799	11
Farm proprietors' income	5,282,519	11	19,529	0
Nonfarm proprietors' income	623,446	1	449,257	11
Less: contributions for social insurance	-3,650,670	-8	-294,013	-7
Less: adjustment for residence	-250,831	-1	-873	-0.02
Net earnings by place of residence	47,501,884	65	4,021,029	66
Dividends, interest, rent	10,879,281	15	1,054,107	17
Transfer payments	14,380,955	20	1,022,841	17
Total personal income	72,762,120	100	6,097,977	100
Population (000s)	3,860		262,755	
Per capita income (dollars)	\$18,849		\$23,208	

<sup>1</sup> In thousands of dollars unless otherwise noted.

<sup>2</sup> In millions of dollars unless otherwise noted.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, unpublished data.

gives a per person measure of the income earned or disbursed to individuals in the economy. As a result, per capita income adjusts for population differences over time or across states.

The chief limitation of personal income as a measure of well-being is that it does not measure activities or things that people value that are not traded in the marketplace. For example, environmental quality or other amenities are not reflected in personal income, nor is the value of leisure time or the value of services provided inside the household. Nevertheless, personal income covers a broad base of economic measures better than any other indicator. For instance, another indicator such as the unemployment rate only gives the percentage of persons without work, not the well-being of those with work. Similarly, the employment rate tells the percentage of persons that are working but not the earnings of those workers. On the other hand, average wages would provide the earnings of workers but not the income non-workers have at their disposal. Consequently, personal income is the best measure of economic well-being that is readily available.

## PER CAPITA INCOME IN KENTUCKY RELATIVE TO THE U.S.

Figure 1 shows the ratio of per capita income in Kentucky to the U.S. average from 1929 to 1995, the entire time period for which per capita income data are available from the National Income and Product Accounts. Two series are shown in Figure 1: the first spans the period from 1929-94, and the second shows the new series recently published by the Bureau of Economic Analysis that covers the period from 1969-95 but is not comparable to the earlier series.<sup>3</sup>

Figure 1 tells an interesting story. Per capita income in Kentucky relative to the U.S. average rose steadily until about 1979 or 1980, exhibiting the long-run convergence familiar to regional and growth economists. For instance, Barro and Sala-i-Martin argue that marginal returns to capital may be higher in states with low income levels, and thus growth may be higher, promoting convergence.<sup>4</sup> Convergence may also occur if there is mobility of businesses and workers across states. Businesses will tend to migrate where land and labor costs are lower,

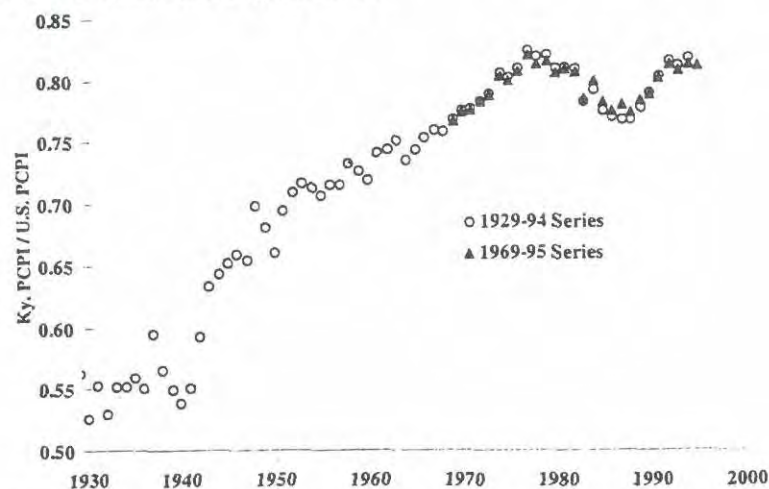
expanding economic activity and raising per capita income. In contrast, workers will tend to migrate where wages are higher, increasing the supply of workers in certain areas and exerting downward pressure on income. The net effect of such mobility would be an equalizing of incomes across states and higher rates of growth in per capita income observed in low income states.<sup>5</sup>

In the long run, with such mobility of businesses and workers, incomes would be completely equalized across states except for differences reflecting location-specific factors. Blomquist, Berger, and Hoehn examine such differences due to location-specific amenities such as climate, air and water quality, and other natural conditions.<sup>6</sup> For example, if people find Kentucky to be a pleasant place to live because of its climate or natural features such as rivers or mountains, then per capita incomes may remain below the national average; in other words, Kentucky residents are willing to accept a lower income to live in a desirable location. Per capita incomes in undesirable locations would lie above the national average to compensate individuals for living in unpleasant conditions. Nonetheless, excepting location-specific amenities, both growth theories and regional models of economic behavior predict an eventual convergence of per capita income for Kentucky and the U.S.



**FIGURE 1**

**Kentucky Personal Per Capita Income (PCPI)  
Relative to U.S. Average, 1929-95**



Source: U.S. Department of Commerce, Bureau of Economic Analysis, unpublished data.

Contrary to the long-run pattern of convergence, however, Kentucky's relative per capita income fell rather sharply in the early and middle 1980s. This fact suggests that the recession and economic restructuring of that period affected income in Kentucky more than in the rest of the country.<sup>7</sup> Since about 1985, though, Kentucky's per capita income has been rising relative to the national average, so that the state's relative income now stands approximately at its 1979-80 level. Viewed in this light, the recent increase in Kentucky's income has represented a catching up to a level relative to the national average that had been reached previously.

What will the future hold and how quickly can we expect Kentucky's per capita income to converge to the national average? We can get some clues about the process of convergence by looking at the experiences of other states. I turn to this analysis in the next section.

Has this convergence to the national per capita income average been unique to Kentucky, or has it occurred in other states? Table 2 shows that convergence has been proceeding on a nationwide basis regardless if

## Kentucky's Experience Compared to Other States

considering the entire period of available data (1929-94) or the last 10 years. This table shows the average change in the ratio of state to U.S. per capita income, both for those states that began each time period above the national average and those that began below the national average. As would be expected from convergence, the average change for those

states above the average is negative and positive for those below the average. States like Kentucky that are below the national average are catching up over time and those above the national average are falling toward it. Figure 2 focuses on the experience of Kentucky and surrounding states over the last 10 years. It shows that the pattern of convergence to the national average has also occurred in states neighboring Kentucky.

As Kentucky's relative income has risen, has its per capita income ranking among the states changed? Figure 2 shows that there has been no change in rankings over the last 10 years among surrounding states. Table 3 shows the top 10 and bottom 10 states in per capita income rankings in 1985 and 1995, expressed in terms of income relative to the U.S. average. Table 3 shows that even though convergence to the national average has been occurring, the state rankings change slowly. Kentucky was ranked 44th in per capita income in 1985, and after 10 years of convergence, it had only moved up to 43rd by 1995.

On the most basic level, factors that affect per capita income are those which raise or lower the amount of income a person receives in a state. One such set include factors which raise or lower the productivity of the labor force. Most obvious among these is the level of education. Workers in states with higher levels of education among their residents will

**TABLE 2**  
**Convergence of States' Per Capita Income to  
U.S. Average, 1929-94 and 1985-95**

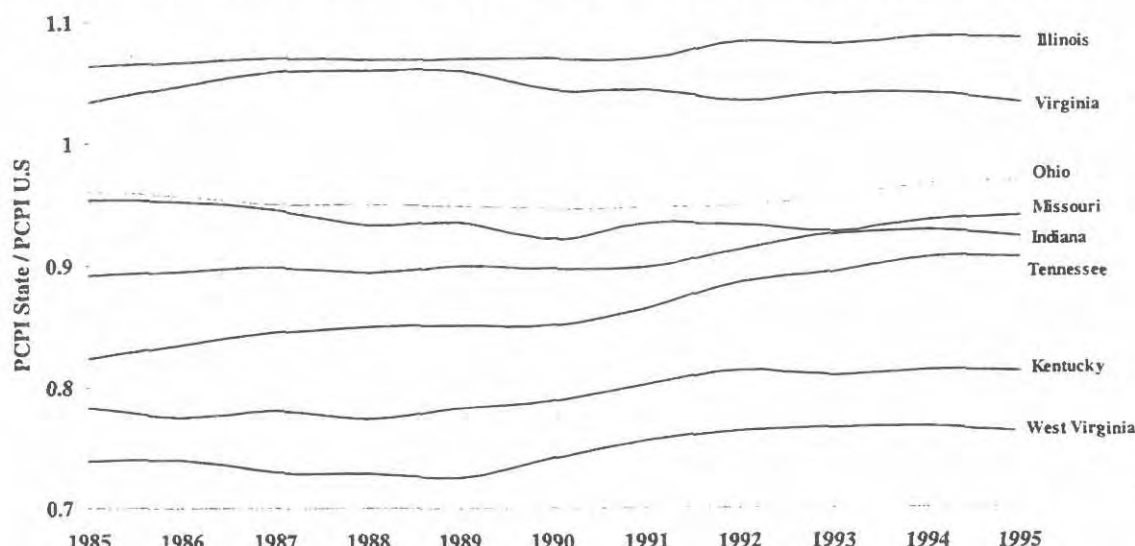
	Time Period	Number of States	Average Change in Relative Income
States above U.S. average, 1929	1929-94	14	-0.1780
States below U.S. average, 1929	1929-94	34	0.1825
States above U.S. average, 1985	1985-95	17	0.0004
States below U.S. average, 1985	1985-95	33	0.0092

Source: U.S. Department of Commerce, Bureau of Economic Analysis, unpublished data.



**FIGURE 2**

Per Capita Personal Income (PCPI) in Kentucky and Surrounding States Relative to U.S. Average, 1985-95



**TABLE 3**

Top 10 and Bottom 10 States Ranked by Personal Per Capita Income (PCI) Relative to U.S. Average, 1985 and 1995

State	1985 Relative PCI	State	1995 Relative PCI
1 Alaska	1.31	Connecticut	1.37
2 Connecticut	1.28	New Jersey	1.29
3 New Jersey	1.24	Massachusetts	1.21
4 Massachusetts	1.17	New York	1.19
5 New York	1.15	Maryland	1.13
6 California	1.15	Delaware	1.13
7 Maryland	1.14	New Hampshire	1.10
8 New Hampshire	1.10	Illinois	1.09
9 Delaware	1.07	Hawaii	1.06
10 Illinois	1.06	Nevada	1.05
41 South Dakota	0.80	Idaho	0.81
42 Montana	0.79	Kentucky	0.81
43 Idaho	0.79	North Dakota	0.80
44 Kentucky	0.78	Oklahoma	0.80
45 South Carolina	0.78	Montana	0.79
46 Alabama	0.77	Utah	0.79
47 Utah	0.76	New Mexico	0.78
48 Arkansas	0.76	Arkansas	0.78
49 West Virginia	0.74	West Virginia	0.76
50 Mississippi	0.66	Mississippi	0.72

Source: U.S. Department of Commerce, Bureau of Economic Analysis, unpublished data

earn more in the labor market and thus increase those states' per capita income. Not only productivity, but employment of workers in general will be a very important factor affecting per capita income across states. States with a higher percentage of their population working will have more people earning wages and salaries and thus are likely to have a higher per capita income. In addition, whether the state is primarily urban or rural will have an impact on the model. Rural states will have a disproportionate number of individuals working in agriculture, where wages and incomes will tend to be lower. Thus, the very nature of the jobs in rural states will tend to hold down per capita incomes.

I have constructed an econometric model of per capita income that explains variation in income across states in 1995. After experimenting with several different combinations of variables which account for the factors discussed in the previous paragraph, I have specified five variables that do a good job in explaining differences in per capita income across states.<sup>8</sup> Table 4 shows these variables and the results of the estimated econometric model. This table also shows the average values of the variables across all the states and the Kentucky values of the variables which will help explain why Kentucky's income is below the national average.

From these econometric estimates, the following conclusions can be drawn about the determinants of per capita income across states: States with higher education levels, as measured by the percentages of the population over age 25 that are high school and college graduates, have higher per capita incomes. States with higher private



**TABLE 4**

**Econometric Estimates Explaining Per Capita Income by State, 1995 \***

Variable	Estimated effect <sup>b</sup>	Kentucky value	Average of states
% of population over 25 & high school graduate	0.0096 *	31.7	30.9
% of population over 25 & college graduate	0.0208 *	13.6	20.0
Private sector employment per capita	0.7679 *	0.4361	0.4860
Public sector employment per capita	-0.4528	0.0832	0.0965
% of population living in rural areas	-0.0039 *	48.1	31.1
Intercept	9.083 *	—	—
Log of per capita personal income	—	9.844	10.00

\* The dependent variable is the natural log of per capita personal income. Fifty-one observations (including the District of Columbia) were used in the analysis. The R<sup>2</sup> for the estimated model is 0.7615.

<sup>b</sup> A \* denotes statistical significance at the 5 percent level in a two-tailed test.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, unpublished data.

sector employment per capita also have higher income per capita. Interestingly, states with higher government employment per capita, holding other variables constant, have lower per capita income. This finding suggests that improvements in per capita income are more likely to be obtained if job growth comes from the private rather than the public sector. Finally, as expected, states with higher rural populations have lower per capita incomes.

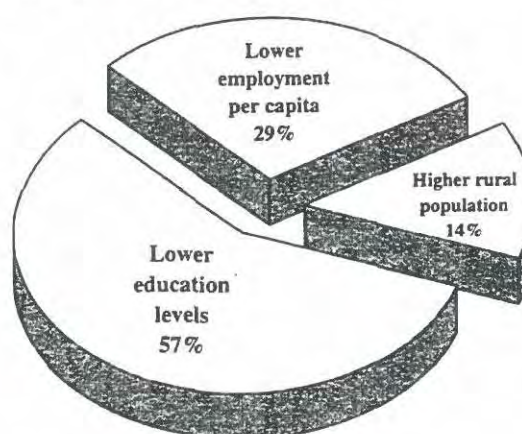
The results of the econometric model can be used to explain why Kentucky's per capita income level is below that of the average across all states. This is done by

## Why is Kentucky's Per Capita Income Below the National Average?

calculating the differences in the predicted per capita incomes arising from differences in education levels, employment per capita, and the percentage of population that is rural between Kentucky and the U.S. Figure 3 shows this calculation. We see that 57 percent of the difference between Kentucky's predicted per capita income and the predicted average of the states' per capita incomes is due to education differences — primarily Kentucky's low percentage of college graduates among the population age 25 and over. That Kentucky is a much more rural

**FIGURE 3**

**Explaining the Difference Between Kentucky and U.S. Per Capita Income, 1995**



Source: Calculated from results shown in Table 4.

state than average accounts for 29 percent of the difference, and the remaining 14 percent comes from the fact that Kentucky's employment per capita is lower than the average of the rest of the states.

Thus, the lion's share of the difference arises from the lower education levels in Kentucky compared to the average of other states. If education levels were higher, Kentucky's per capita income would be closer to the national average. In fact, the model suggests that if Kentucky's education levels were equal to the national average, 57 percent of the gap between Kentucky's per capita income and the national average per capita income could be closed.

In considering why Kentucky's per capita income has risen relative to the rest of the country from 1985 to 1995, we need to look for trends in Kentucky that are different from the rest of the country. Education levels have been improving over time both in Kentucky and in the rest of the country, so education cannot explain the

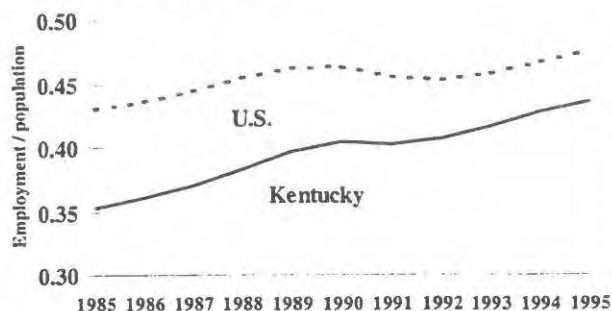
rising per capita income in Kentucky. Similarly, there has been a small decline in the percentage of the population living in rural areas in both Kentucky and the rest of the country. That leaves employment/population changes.

While the recession of the early 1980s was particularly hard on Kentucky, the opposite was true for the recession of the early 1990s. Kentucky barely felt that recession, and since then, job growth has been



**FIGURE 4**

**Private Sector Employment Per Capita in Kentucky and U.S., 1985-95**



Source: U.S. Department of Commerce, Bureau of Economic Analysis, unpublished data.

stronger in Kentucky than in many other places. At the same time, population growth in Kentucky has not been as strong as in the rest of the country. These two factors combined imply that employment per capita has been rising faster in Kentucky than in the rest of the country. Figure 4 shows the changes in private employment per capita in Kentucky and for the U.S. From this figure it is apparent that private employment per capita has been increasing faster in Kentucky than in the rest of the country, and this difference may be partially responsible for the relative gain in Kentucky per capita income from 1985-95. This employment growth has in part contributed to the resumption in the convergence of Kentucky's per capita income to the U.S. average so that it is now back to the level it was before the recession of the late 1970s and early 1980s.

## MAKING THEM EQUAL

We can use the results of our econometric model to construct scenarios under which Kentucky's per capita income would be equal to the U.S. per capita income. We must ask how different Kentucky's characteristics must be for the state's per capita income to be equal or greater than the U.S. average. In Table 5, I consider three different scenarios that might accomplish this goal. The first scenario increases Kentucky's education levels until the predicted per capita income from the model matches the national average. Under this scenario, Kentucky would have the same number of jobs, but its workers would be

more educated and hence more productive, all of which would raise incomes. The second scenario increases private sector employment per capita, increasing the number of jobs while holding education levels constant. More jobs might exist because there are more employers in the state, or labor force participation rates, which are lower in Kentucky than in most other states, might rise. In the third scenario both education levels and private sector employment per capita are raised. All three

*... to have a per capita income level equal to the national average at present, Kentucky would need a far different economy and a much more educated workforce.*

scenarios hold constant the percentage of the population living in rural areas and the number of government jobs per capita.

Scenario 1 means Kentucky would have a 50 percent higher percentage of the population age 25 and over with a bachelor's degree or higher and a 20 percent higher percentage of high school graduates. Kentucky would then lie almost exactly at the average of the other states for the percentage of college graduates (20.4 percent vs. 20.3 percent) and well above the average of the other states for the percentage of the population that are high school graduates that did not attend college (38.0 percent vs. 30.9 percent). In fact, such a 20 percent increase in the percentage of the population that are high school graduates only would place Kentucky ahead of all other states, including Pennsylvania, where 38.7 percent of the population age 25 and over are high school graduates.

Scenario 2 would correspond to a 60 percent increase in the number of private sector jobs per capita. This would put Kentucky far above the average of the other states.

**TABLE 5**

**Changes in Kentucky's Education Levels and Employment Required for Per Capita Personal Income to be Equal to or Greater than U.S. Average, 1995**

Characteristic	Scenario 1	Scenario 2	Scenario 3
% of population 25 and over & high school graduate	+ 20%	—	+ 10%
% of population 25 and over & college graduate	+ 50%	—	+ 25%
Private sector employment per capita	—	+ 60%	+ 30%

Source: Calculated from results shown in Table 4.



## Kentucky's Per Capita Income: Catching Up to the Rest of the Country

In fact, only the District of Columbia would have a higher number of private sector jobs per capita and many of its jobs are held by commuters who do not live in the District.

Scenario 3 corresponds to increases in education levels and private sector employment per capita that are half the sizes of those in Scenarios 1 and 2. Such a combination of characteristics would give Kentucky a percentage of high school graduates similar to Nebraska and Vermont, a percentage of college graduates the same as Wisconsin and Idaho, and a private sector employment per capita similar to Nevada and Colorado. In general, the scenarios show that, to have a per capita income level equal to the national average at present, Kentucky would need a far different economy and a much more educated workforce.

### HOW LONG WILL IT TAKE?

Following the scenarios presented above, Kentucky would require a long time to catch up to the average U.S. per capita income. It might take a generation to raise education levels as much as needed, and, if education levels were rising at the same rate in the rest of the country as well, per capita income in Kentucky would not rise at all relative to the national average. On the other hand, the process of regional convergence, where capital and labor flow to areas with the highest return, should naturally raise per capita income in Kentucky relative to the rest of the country, as it has done in the past.

How soon should we reasonably expect this convergence? Looking at the long-term trends in Kentucky's per capita income relative to the U.S. average, we can see that it took over 30 years to increase Kentucky's relative per capita income from approximately 60 percent to 80 percent of the national average. To obtain more precise estimates of the rate of convergence, I have estimated regression models of Kentucky's relative per capita income over various time periods and reported the results in Table 6. As can be

seen the estimates range from a predicted increase of 0.0045 per year (0.45 percent) over the entire 1929-94 time period of the old series to 0.0060 (0.60 percent) per year estimated from 1929-79. These estimates can be used to predict how long it will take Kentucky to move from its current level of 81.2 percent of U.S. per capita income to 100 percent of the U.S. level. Using the highest estimated rate of convergence (0.60 percent), Kentucky will catch up to the national average in 31 years and will reach 90 percent of the national average in 15 years.

Using any of the three estimates, it is clear that the convergence of Kentucky's per capita income to the national average is a long-run process and difficult to accomplish overnight. Even if Kentucky were to increase the highest estimated long-run rate of convergence by 50 percent, it would still take 21 years for the state to reach the national average level of per capita income.

### CONCLUSION

Will Kentucky in fact reach this national average? Probably, given the progression toward convergence that has been and is still occurring in the U.S. Of course, if Kentucky is a desirable place to live and work, it may never completely reach the national average because residents will accept lower incomes to live here. Based on past trends of convergence, it will take many years for Kentucky's per capita income to reach the national average. The process could be accelerated, but it would be difficult. It would require that education levels or jobs grow faster than the national average, which may be difficult for Kentucky to sustain.

**TABLE 6**

**Estimated Rates of Convergence and Number of Years until Kentucky Per Capita Income Equals U.S. Average Per Capita Income**

Time period of estimation	Estimated annual convergence rate	Number of years until equality reached	Number of years until 90% of U.S. average reached
1929-94	0.45%	42	20
1929-79	0.60%	31	15
1986-95	0.51%	37	17

Source: Calculated using U.S. Department of Commerce, Bureau of Economic Analysis unpublished data.



Two Studies

Economic Impact

of

**Public Higher Education**

in

**Kentucky**



# Economic Impacts of Kentucky's Public Institutions of Higher Education

Two reports produced by researchers at the University of Kentucky analyze and estimate the economic impacts of Kentucky's public institutions of higher education. One of the reports was authored by Dr. Charles F. Haywood, Director, Center for Business and Economics Research, and National City Bank Professor of Finance, College of Business and Economic, University of Kentucky. His report estimates the annual economic multiplier effects on total output, household earnings, and employment in Kentucky for the 1991-1992 fiscal year.

The second report is by Professors Mark C. Berger and Dan A. Black, of the University of Kentucky's Department of Economics. It focuses on the long-term impacts of state support of public higher education in Kentucky. The Berger-Black paper is an innovative analysis of the "human capital" value of public higher education in Kentucky. Both reports focus on the statewide impacts of the eight public institutions taken together: Eastern Kentucky University, Kentucky State University, Morehead State University, Murray State University, Northern Kentucky University, University of Louisville, Western Kentucky University, and University of Kentucky, including the UK Community College System.

In the 1991-1992 fiscal year, the state appropriations to Kentucky's eight public institutions of higher education totaled \$672.2 million. The 1991-1992 fiscal year was the latest year for which detailed financial results were available for all public institutions when this study was made.

The state's expenditures had very substantial multiplier effects increasing the annual level of economic activity in the state. In the 1991-1992 fiscal year, aggregate spending in Kentucky was \$2,292.2 million greater than it would have been in the absence of the state's public universities and colleges. The implied state-funding multiplier for 1991-1992 was 3.4. That is, each \$1.00 of state funding generated \$3.40 of total spending in Kentucky. To give further perspective to the total output



effect of \$2,292.2 million, it is helpful to note that in 1991 total personal income in Kentucky was \$58,027 million. The \$2,292.2 million of aggregate output impacts of the state's public universities and colleges equaled 4.0 percent of that figure.

The number of persons employed in Kentucky in 1991-1992 was 67,862 greater than it would otherwise have been. The state-funding multiplier for employment in 1991-1992 was 5.94. State funding resulted directly in 11,430 jobs at the eight institutions, and the multiplier effects generated an additional 56,432 jobs in the Kentucky economy. The total employment effect in Kentucky was 67,862 jobs. This employment impact of 67,862 was 4.2 percent of the state's 1991 total employment of 1,615,000.

Wages and salaries throughout the state in 1991-1992 were \$1,555.9 million greater than would otherwise have been the case. Approximately \$396.7 million was directly attributable to General Fund support of the public institutions of higher education. The implied state-funding earnings multiplier was 3.92. That is, for each \$1.00 of general fund support directed to payroll, \$2.92 of additional earnings were generated at the institutions and in other sectors of the Kentucky economy. The earnings effect of \$1,555.9 million was 3.8 percent of the \$40,581 million of the 1991 total earnings of Kentucky's wage and salary workers.

Turning to the long-term impacts, the state universities and colleges in 1991-1992 added \$8,518 million to the present value of the state's human capital stock. This figure represents the present value of the increases in lifetime earnings that the students enrolled in 1991-1992 gained by adding one more year to their educational experience. The \$8,518 million should be regarded as an annual "value-added" figure. The value-added increments were \$7.596 million for 1989-1990, \$8,022 million for 1990-1991, \$8,518 million for 1991-1992, and \$8,584 for 1992-1993. That is, in four years -- or two bienniums -- the state universities and colleges produced \$32.7 billion of



enhanced human capital earning power through their instructional programs. Professors Berger and Black also calculate various measures of human capital enhancement on a net basis, i. e., after subtracting appropriate costs. The "Government Return" for 1991-1992 was \$7,846 million, after subtracting the General Fund support for the public universities and colleges. The "Social Return" for 1991-1992 was \$7,248 million, after subtracting private as well as public costs.



# Executive Summary

- State expenditures in support of Kentucky's eight public institutions of higher education have substantial multiplier effects, making for higher levels of income and employment than would otherwise exist in the Kentucky economy.
- Each \$1.00 of state support for higher education in Kentucky in the 1991-1992 fiscal year resulted in \$3.40 of total spending in the Kentucky economy.
- In the 1991-1992 fiscal year the \$672 million of state appropriations to the public institutions stimulated \$2.29 billion in total public and private spending in Kentucky.
- The \$2.29 billion of total spending attributable to the direct and indirect effects of state support of higher education was equal to 4.0 percent of Kentucky's 1991 aggregate personal income of \$58.0 billion.
- The related multiplier for employment in 1991-1992 was 5.94. For each job supported by state funding at the public universities and colleges, an additional 4.94 jobs in the public and private sectors of the Kentucky economy resulted from the direct and indirect spending effects of the state's support.
- In fiscal year 1991-1992 total employment in Kentucky was 67,862 greater than it would otherwise have been in the absence of state support for higher education. This employment impact was 4.2 percent of the state's 1991 total employment of 1,615,000.
- Wages and salaries throughout the state in 1991-1992 were \$1.56 billion greater than would have been the case in the absence of state support for the public universities and colleges. State support accounted directly for \$397 million, and the multiplier effects accounted for \$1.16 billion.
- The \$1.56 billion of wages and salaries equaled 3.8 percent of the \$40.58 billion of total of wages and salaries received in Kentucky in 1991.
- Data from the 1990 U. S. Census clearly demonstrate that higher education substantially increases a person's life-time earnings. Each year of higher education adds to a person's "human capital value" in essentially the same way as saving and investing in a long-term bond adds to a person's net wealth today.
- The "human capital value" of the persons enrolled in Kentucky's eight public institutions of higher education in 1991-1992 was increased by \$8.52 billion as a result of adding that year of higher education to their qualifications.



- The state's investment of \$672 million in higher education support in 1991-1992 stimulated an increase of \$8.52 billion in the "human capital" wealth of Kentucky.
- The addition of \$8.52 billion to Kentucky's "human capital" wealth in 1991-1992 is for that year alone. In the four years 1989-90 through 1992-1993, the annual "value-added" additions totaled \$32.7 billion. In comparison, state support during these four fiscal years totaled \$2.54 billion. The "pay back" in the form of increase "human capital" wealth was 12.9 times the state's investment.
- The public institutions included in this analysis were: Eastern Kentucky University, Kentucky State University, Morehead State University, Murray State University, Northern Kentucky University, University of Louisville, Western Kentucky University, and University of Kentucky, including the UK Community College System.

TABLE 12: Total Long Run Economic Impact by Gender  
Degree Level, and Year, in Billions of 1993 Dollars

	1989-90	1990-91	1991-92	1992-93
<b>MALES</b>				
Associate Degree	.904	.967	1.104	1.144
Bachelor's Degree	2.939	3.048	3.134	3.059
Master's Degree	.181	.175	.192	.193
Doctorate or Prof. Degree	.245	.242	.256	.277
Total Male Impact	4.268	4.432	4.687	4.673
<b>FEMALES</b>				
Associate Degree	1.410	1.605	1.788	1.873
Bachelor's Degree	1.628	1.687	1.730	1.710
Master's Degree	.221	.227	.234	.246
Doctorate or Prof. Degree	.069	.071	.078	.082
Total Female Impact	3.330	3.590	3.831	3.911
Total Impact	7.598	8.022	8.518	8.584
Source: Authors' Calculations				

TABLE 13: Total Long Run Economic Impact by Broad Field of Study  
and Year, in Billions of 1993 Dollars

	1989-90	1990-91	1991-92	1992-93
Universities				
Business	\$.767	\$.772	\$.737	\$.671
Liberal Arts	.706	.756	.698	.789
Engineering	.574	.601	.667	.670
Science	1.103	1.184	1.313	1.426
Education	.397	.421	.538	.467
Other/Undeclared/Non-Degree	1.975	1.973	1.944	1.828
Community Colleges	2.075	2.315	2.620	2.732
Total Impact	7.598	8.022	8.518	8.584
Source: Authors' Calculations				